National Aeronautics and Space Administration

NASA Scientific and Technical Document Availability Authorization (DAA)

The DAA approval process applies to all forms of published NASA Scientific and Technical Information (STI), whether disseminated in print or electronically. It is to be initiated by the responsible NASA Project Officer, Technical Monitor, author, or other appropriate NASA official for all presentations, reports, papers, and proceedings that contain NASA STI. Explanations are on the back of this form and are presented in greater detail in NPG 2200.2, "Guidelines for Documentation, Approval, and Dissemination of NASA Scientific and Technical Information."

☐ Original
☐ Modified

I. DOCUMENT/PROJECT IDENTIFICATION

TITLE	AUTHOR(S)
Black and Turkey Vulture interactions with Bald Eagles.	Stolen, E. D.

ORIGINATING NASA ORGANIZATION	PERFORMING ORGANIZATION *(If different)*
Kennedy Space Center Biomedical Office	Dynamac Corporation, KSC

CONTRACT/GRANT/INTERAGENCY/PROJECT NUMBER(S)	DOCUMENT NUMBER(S)	DOCUMENT DATE
	Fla. Field Nat. 24: 43-45	1996

For presentations, documents, or other STI to be externally published (including through electronic media), enter appropriate information on the intended publication such as name, place, and date of conference, periodical, or journal name, or book title and publisher in the next box. These documents must be routed to the NASA Headquarters or Center Export Control Administrator for approval (see Sections III and VIII).

II. SECURITY CLASSIFICATION

CHECK ONE *(One of the five boxes denoting Security Classification must be checked.)*

☐ SECRET ☐ SECRET RD ☐ CONFIDENTIAL ☐ CONFIDENTIAL RD ☒ UNCLASSIFIED

III. AVAILABILITY CATEGORY

☐ ITAR ☐ EAR

Export Controlled Document - USML Category /CCL Export Control Classification Number (ECCN) *(Documents marked in this block must have the concurrence/approval of the NASA Headquarters or Center Export Control Administrator (see Section VIII).)*

Confidential Commercial Document *(check appropriate box at left and indicate below the appropriate limitation and expiration)*:

☐ TRADE SECRET
☐ SBIR
☐ COPYRIGHTED

☐ U.S. Government agencies and U.S. Government agency contractors only
☐ NASA contractors and U.S. Government only
☐ U.S. Government agencies only
☐ NASA personnel and NASA contractors only
☐ NASA personnel only
☐ Available only with the approval of issuing office:
☐ Limited until *(date)*

☒ PUBLICLY AVAILABLE

Publicly available documents must be unclassified, may not be export controlled, may not contain trade secret or confidential commercial data, and should have cleared any applicable patents application process.

IV. DOCUMENT DISCLOSING AN INVENTION

THIS DOCUMENT MAY BE RELEASED ON *(date)*	NASA HQ OR CENTER PATENT OR INTELLECTUAL PROPERTY COUNSEL SIGNATURE	DATE

V. BLANKET RELEASE (OPTIONAL)

☐ All documents issued under the following contract/grant/project number may be processed as checked in Sections II and III.

☐ The blanket release authorization granted on *(date)*

☐ is RESCINDED - Future documents must have individual availability authorizations.

☐ is MODIFIED - Limitations for all documents processed in the STI system under the blanket release should be changed to conform to blocks as checked in Sections II and III.

PLEASE CONTINUE ON REVERSE SIDE.

VI. AUTHOR/ORIGINATOR VERIFICATION

I HAVE DETERMINED THAT THIS PUBLICATION:

☐ DOES contain export controlled, confidential commercial information, and/or discloses an invention for which a patent has been applied, and the appropriate limitation is checked in Sections III and/or IV.

☒ does NOT contain export controlled, confidential commercial information, nor does it disclose an invention for which a patent has been applied, and may be released as indicated above.

NAME OF AUTHOR/ORIGINATOR	MAIL CODE	SIGNATURE	DATE
Eric Stolen	Dyn-2	Eric D. Stolen	4/16/98

VII. PROJECT OFFICER/TECHNICAL MONITOR/DIVISION CHIEF REVIEW

☒ APPROVED FOR DISTRIBUTION AS MARKED ON REVERSE ☐ NOT APPROVED

NAME OF PROJECT OFFICER OR TECH. MONITOR	MAIL CODE	SIGNATURE	DATE
RAYMOND M. WHEELER	JJ-G	R. M. Wheeler	4/20/98

VIII. EXPORT CONTROL REVIEW/CONFIRMATION

☑ Public release is approved ☐ Export controlled limitation is not applicable

☐ Export controlled limitation is approved ☐ Export controlled limitation (ITAR/EAR) marked in Section III is assigned to this document:

USML CATEGORY NUMBER	CCL ECCN NUMBER	HQ OR CENTER EXPORT CONTROL ADMINISTRATOR *(as applicable)*	DATE
		Dennis J. Miller	4/16/98

IX. PROGRAM OFFICE OR DELEGATED AUTHORITY REVIEW

☒ APPROVED FOR DISTRIBUTION AS MARKED ON REVERSE ☐ NOT APPROVED CODE M, DAA LETTER, 6/14/94

NAME OF PROGRAM OFFICE REPRESENTATIVE	MAIL CODE	SIGNATURE	DATE
Audrey Lee Silipo	FF-S2-A	Audrey Lee Silipo	4/14/98

X. DISPOSITION

THIS FORM, WHEN COMPLETED, IS TO BE SENT TO YOUR CENTER PUBLICATIONS OFFICE

INSTRUCTIONS FOR COMPLETING THE NASA SCIENTIFIC AND TECHNICAL DOCUMENT AVAILABILITY AUTHORIZATION (DAA) FORM

Purpose. This DAA form is used to prescribe the availability and distribution of all NASA-generated and NASA-funded documents containing scientific and technical information (including those distributed via electronic media such as the World Wide Web and CD-ROM).

Requirements. The author/originator must provide either a suitable summary description (title, abstract, etc.) or a completed copy of the document with this form. This form is initiated by the document author/originator and that individual is responsible for recommending/determining the availability/distribution of the document. The author/originator completes Sections I through III, and VI. The author/originator is also responsible for obtaining information and signature in Section IV to the extent the document discloses an invention for which patent protection has been applied. Subsequent to completion of these sections, the author/originator forwards the document to the appropriate Project Manager/Technical Monitor/Division Chief for further review and approval in Section VII, including a re-review of the planned availability and distribution. Once this approval is obtained, the DAA is forwarded to the NASA Headquarters or Center Export Administrator for completion of Section VIII. It is then forwarded for completion of Section IX to the cognizant NASA Headquarters Program Office or Delegated Authority, who provides final review and approval for release of the document as marked.

When to Use This Form. Documents containing STI and intended for presentation or publication (including via electronic media) must be approved in accordance with the NASA STI Procedures and Guidelines (NPG 2200.2). Documents that are to be published in the NASA STI Report Series must be coordinated with the appropriate NASA Headquarters or Center Scientific and Technical Information Office in accordance with NPG 2200.2. Note that information on the Report Documentation Page (if attached) is not to be entered on the DAA except for title, document date, and contract number.

How to Use this Form. Specific guidelines for each section of this form are detailed below.

I. Document/Project Identification. Provide the information requested. If the document is classified, provide instead the security classification of the title and abstract. (Classified information must not be entered on this form). Include RTOP numbers on the Contract/Grant/Interagency/Project Number(s) line. Provide information on presentations or externally published documents as applicable.

II. Security Classification. Enter the applicable security classification for the document. Documents, if classified, will be available only to appropriately cleared personnel having a "need to know."

III. Availability Category for Unclassified Documents. Check the appropriate category or categories.

Export Controlled Document. If the document is subject to export restrictions (see NPG 2200.2, paragraph 4.5.3), the appropriate restriction must be checked, either International Traffic in Arms Regulations (ITAR) or Export Administration Regulations (EAR), and the appropriate United States Munitions List (USML) category or Commerce Control List (CCL), Export Control Classification Number (ECCN) must be cited.

Confidential Commercial Documents (Documents containing Trade Secrets, SBIR documents, and/or Copyrighted information). Check the applicable box (see NPG 2200.2 paragraph 4.5.7). When any of these boxes are checked, also indicate the appropriate limitation and expiration in the list to the right of these restrictions. These limitations refer to the user groups authorized to obtain the document. The limitations apply both to the initial distribution of the documents and the handling of requests for the documents. The limitations will appear on and apply to reproduced copies of the document. Documents limited to NASA personnel should not be made available to onsite contractors. If the Available Only With the Approval of Issuing Office limitation is checked, the NASA Center for AeroSpace Information will provide only bibliographic processing and no initial distribution; CASI will refer all document requests to the issuing office.

Publicly Available Document - Unrestricted Distribution. Check this box if the information in the document may be made available to the general public without restrictions (unrestricted domestic and international distribution). If the document is copyrighted (see paragraph 4.5.7.3 in NPG 2200.2), also check the "Copyrighted" box in this section.

IV. Document Disclosing an Invention. This must be completed when the document contains information that discloses an invention (see NPG 2200.2, paragraph 4.5.9). When this box is checked, an additional appropriate availability category must be checked. Use of this category must be approved by NASA Headquarters or Center Patent Counsel or the Intellectual Property Counsel.

V. Blanket Release (Optional). Complete this optional section whenever subsequent documents produced under the contract, grant, or project are to be given the same distribution and/or availability as described in Sections II and III. More than one contract number or RTOP Number can be entered. This section may also be used to rescind or modify an earlier Blanket Release. All blanket releases must be approved by the Program Office or its designee and concurred with by the Office of Management Systems and Facilities.

VI. Author/Originator Verification. Required for all DAA forms.

VII. Project Officer/Technical Monitor/Division Chief Review. The Project Officer/Technical Monitor/Author or Originator Division Chief or above must sign and date the form. The office code and typed name should be entered.

VIII. Export Control Review/Confirmation. This section is to be completed by the authorized NASA Headquarters or Center Export Control Administrator for all documents.

IX. Program Office or Delegated Authority Review. This section is to be completed by the duly authorized official representing the NASA Headquarters Program Office. Any delegation from NASA Headquarters to a NASA Center in accordance with NPG 2200.2 should be entered here.

X. Disposition. For NASA Center use.

Fla. Field Nat. 24(2): 43-45, 1996.

BLACK AND TURKEY VULTURE INTERACTIONS WITH BALD EAGLES IN FLORIDA

ERIC DOUGLAS STOLEN
Department of Biology, University of Central Florida, Orlando, Florida 32816

Although there are few published accounts of interactions of either the Black Vulture (*Coragyps atratus*) or the Turkey Vulture (*Cathartes aura*) with large predatory birds, competitive interactions due to overlap in use of carrion might be expected. Crested Caracara (*Caracara plancus*) routinely harass Turkey Vultures around carcasses causing them to disgorge food items that the caracara then eats (Glazener 1964). Reports of eagles interacting with vultures are uncommon. Oberholser (*in* Bent 1937) recounted that Bald Eagles (*Haliaeetus leucocephalus*) do not ". . . hesitate even to pursue the vultures and compel them to disgorge, when if it fails to catch the coveted morsels before they reach the ground it alights and devours them. Audubon relates that on one occasion he saw [a Bald Eagle] kill a vulture that for some reason was unable completely to disgorge". Audubon (*in* Bent 1937) wrote that when eagles appear at a carcass vultures ". . . retire and patiently wait until their betters are satisfied". Coleman and Fraser (1986) reported that an immature Golden Eagle (*Aquila chrysaetos*) startled several hundred Black and Turkey Vultures and then attacked a Black Vulture that subsequently escaped after regurgitating. They provided indirect evidence that the eagle then ate the regurgitate. Although both species of vultures have been said to lack major predators in North America away from their nests (Townsend 1937, Jackson 1988a, 1988b), these observations suggest that they have reason to be wary of large predatory birds.

During experiments in central Florida where small mammal carcasses were used to attract vultures, I saw two interactions between vultures and Bald Eagles. At 1318 EST on 20 February 1993, while baiting in a cow pasture near Kissimmee, Florida, I watched vultures feed on the carcass of a raccoon (*Procyon lotor*). After several hours of observation, I saw the seven Black and three Turkey Vultures present on the ground near the carcass fly away. As the birds departed an immature Bald Eagle flew approximately 1 m above the ground following the departing vultures. The eagle flew out of sight and the vultures kettled and drifted off. Nine minutes latter one Black and one Turkey Vulture flew over the carcass. Four minutes later, two Black Vultures landed at the carcass and began feeding. A similar event occurred on 9 October 1993, while I was baiting in the same field with another raccoon carcass. At 1348 EST nine Black Vultures and one Turkey Vulture were on the ground near the carcass when all suddenly flew away. I watched them leave, then looked back at the carcass and saw an adult Bald Eagle flying approximately 10 m above the carcass. The bird turned sharply just before it flew over me and then flew out of sight. The vultures kettled and drifted off. No birds returned to feed at the carcass for the remainder of the day. In both instances I believe that the interaction between the eagle and vultures was abbreviated due to my presence.

While conducting research at a vulture communal roost near Kissimmee, Florida, I observed Bald Eagles near the roost on five separate occasions and noted their affect on Black Vulture behavior. In the late afternoon on 28 February 1993 and the morning of 6 May 1993, I observed Bald Eagles harassing Ospreys (*Pandion halieteus*) within 100 m of roosting Black and Turkey Vultures. On both occasions the Black Vultures appeared agitated in the presence of the eagles, as they flew between perches and looked around more than I usually observed. On the morning of 8 April 1993, I arrived at the roost shortly after sunrise and found an adult Bald Eagle in the main roost tree. There were no

Black Vultures in sight, although I observed numerous Black Vultures at this roost in the early morning on over 50 other visits. There was one Turkey Vulture near the eagle and I was able to locate several other Black Vultures and Turkey Vultures approximately 200 m from the roost site perched low in trees.

On two other occasions the presence of Bald Eagles at this roost did not have apparent influence on Black Vulture behavior. During the afternoon of 17 December 1993, two adult Bald Eagles were at the roost between 1502 and 1608 EST. During this time several Black Vultures arrived at the roost. Also during this time at least 11 Black Vultures and 13 Turkey Vultures were flying above the roost. Cathartid vultures often fly above a communal roost in the late afternoon in what has been described as a roost display (Rabenold 1983). The vulture's behavior did not seem to be modified by the eagles presence. On the morning of 27 December 1993, I arrived at the roost shortly after sunrise and observed one adult Bald Eagle, 53 Black Vultures, and seven Turkey Vultures. Fifteen of the Black Vultures and four of the Turkey Vultures were within 50 m of the eagle.

These observations suggest that interactions with large predatory birds may constitute a selective pressure on Black and Turkey Vulture behavior. Such interactions appear most important at carcasses, although Bald Eagle presence at communal roosts has some affects on Black Vulture behavior. Further evidence of the importance of harassment by large predatory birds or mammals may be found in the vulture's familiar habit of regurgitating when confronted. Although Stewart (1983) has suggested that this behavior may lack purpose, I believe that this behavior does have use. By providing a potential predator or aggressor with food the vulture may distract the predator allowing time for escape. Maynard (1881) eluded to this same idea. An alternative explanation may be that by jettisoning food the vulture reduces its weight to facilitate escape. If the purpose of regurgitation were solely to facilitate flight, it would have no function in the flightless chicks. But numerous observers have noted that chicks of the cathartids regularly regurgitate in response to intruders at the nest (Brown and Amadon 1968, Jackson 1988a, 1988b, Ritter 1983, Townsend *in* Bent 1937). The fact that the Black and Turkey Vulture possess this behavior may suggest that they are subject to selective pressures resulting from aggressive competition or predation.

I thank Megan Stolen, Richard Thompson, and Pat Harden for assisting with this project. David Breininger, Jerome A. Jackson, Brian Millsap, Ron Schaub, and Walter K. Taylor provided helpful editorial suggestions.

Literature Cited

BENT, A. C. 1937. Life histories of North American birds of prey. Part 1. Smithsonian Inst. U.S. Natl. Mus. Bull. 167.

BROWN, L., AND D. AMADON. 1968. Eagles, Hawks and Falcons of the World. McGraw-Hill Book Co. New York.

COLEMAN, J. S., AND JAMES D. FRASER. 1986. Predation on Black and Turkey Vultures. Wilson Bull. 98:600-601.

GLAZENER, W. C. 1964. Note on the feeding habits of the caracara in south Texas. Condor 66:162.

JACKSON, J. A. 1988a. American Black Vulture. Pages 11-24. *In*: Handbook of North American Birds, Vol. 4. R. S. Palmer (ed.). Yale Univ. Press, New Haven.

JACKSON, J. A. 1988b. Turkey Vulture. Pages 25-42. In: Handbook of North American Birds, Vol. 4. R. S. Palmer (ed.). Yale Univ. Press, New Haven.

MAYNARD, C. J. 1881. The Birds of Eastern North America. C. J. Maynard & Co., Newtonville, MA.

RABENOLD, P. P. 1983. The communal roost in Black and Turkey Vultures—an information center? Pages 303-321. *In*: Vulture Biology and Management. S. R. Wilbur and J. A. Jackson (eds.). Univ. of California Press, Berkeley.

RITTER, L. V. 1983. Growth, development, and behavior of nestling Turkey Vultures in Central California. Pages 287-302. *In*: Vulture Biology and Management. S. R. Wilbur and J. A. Jackson (eds.). Univ. of California Press, Berkeley.

STEWART, P. A. 1983. The biology and communal behavior of American Black Vultures. Vulture News 9/10:14-36.